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DEC 0 8 2006

PATENT NREL 01-36

Amendments to the claims:

Please amend the claims as shown below...

- 1. (Currently amended) A composition comprising a <u>genetically</u> engineered purified polypeptide <u>expressed in a heterologous host cell, with said polypeptide having</u> cellulase activity and having at least <u>90%</u> 99% identity to SEQ ID NO. 1.
- 2. (Currently amended) The composition of claim 1 wherein the polypeptide comprises a catalytic domain of a glycosyl hydrolase family 74 (GH74_Ace) enzyme defined as including the polypeptide sequence of SEQ ID NO: 3, a carbohydrate binding domain (CBD) III, a linker, and a signal sequence.
 - 3. (Cancelled).
- 4. (Previously presented) The composition of claim 2 wherein the carbohydrate binding domain (CBD) III of the polypeptide is further defined as comprising a length of about 80 to about 150 amino acids.
- 5. (Previously presented) The composition of claim 2 wherein the carbohydrate binding domain (CBD) III of the polypeptide is further defined as comprising a length of about 90 amino acids.
 - 6. (Cancelled).
- 7. (Previously presented) The composition of claim 2 wherein the carbohydrate binding domain (CBD) III is further defined as comprising the polypeptide sequence of SEQ ID NO: 4.
- 8. (Previously presented) The composition of claim 2 wherein the carbohydrate-binding domain (CBD) III is further defined as comprising the polypeptide sequence of SEQ ID NO: 5.
- 9. (Previously presented) The composition of claim 2 wherein said polypeptide comprises sequences identical to the polypeptides of SEQ ID NO: 3 and SEQ ID NO: 4.

10-11. (Cancelled)

12. (Currently amended) A <u>genetically engineered</u> purified polypeptide <u>expressed in a heterologous host cell, said polypeptide</u> having at least <u>90%</u> 99% identity to SEQ ID NO: 1.

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- 13. (Cancelled)
- 14. (Previously presented) An industrial mixture suitable for degrading cellulose, such mixture comprising the polypeptide of claim 1.
- 15. (Previously presented) The industrial mixture of claim 14 further defined as comprising a detergent.

16-27 (Cancelled)

- 28. (Currently amended) A <u>composition comprising a genetically engineered-purified</u> polypeptide <u>expressed in a heterologous host cell, said polypeptide</u> having at least <u>90%</u> 99% identity to [a] <u>the polypeptide</u> sequence selected from the group consisting of:
- ——a) SEQ ID NO: 3,; said polypeptide having catalytic activity of a glycosyl hydrolase family 74 (GH74 Ace) enzyme.
 - b) SEQ ID NO: 4:
- ---- c) SEQ ID NO: 5; and
- d) SEQ-ID-NO: 1,
 - 29. (Cancelled)
- 30. (Original) A fusion protein comprising the polypeptide of claim 28 and a heterologous peptide.
- 31. (Currently amended) The fusion protein of claim 30, wherein the heterologous peptide is a substrate targeting moiety <u>and said substrate is a carbohydrate polymer</u>.
- 32. (Original) The fusion protein of claim 30, wherein the heterologous peptide is a peptide tag.
- 33. (Previously presented) The fusion protein of claim 32, wherein the peptide tag is 6-His, thioredoxin, hemaglutinin, glutathione S-tranferase, or OmpA signal sequence tag.
- 34. (Original) The fusion protein of claim 30, wherein the heterologous peptide is an agent that promotes polypeptide oligomerization.
- 35. (Original) The fusion protein of claim 34, wherein the agent is a leucine zipper.

- 36. (Previously presented) A cellulase-substrate complex comprising the polypeptide of claim 28 bound to cellulose.
 - 37-42 (Cancelled)
- 43. (Previously presented) A composition comprising the polypeptide of claim 28 and a carrier.
 - 44-46. (Cancelled)
 - 47. (Cancelled)
- 48. (Currently amended) The composition of claim <u>1</u> 47 wherein said polypeptide retains at least the same level of cellulase activity and thermal tolerability as those exhibited by the peptide of SEQ ID NO. 1.
 - 49. (Cancelled)
- 50. (Currently amended) The A composition comprising a genetically engineered polypeptide expressed in a heterologous host cell, said polypeptide having at least 90% identity to SEQ ID NO. 1, said polypeptide comprising a ef claim 49 wherein said catalytic domain of a glycosyl hydrolase family 74 (GH74 Ace) enzyme GH74_Ace having a sequence identical to SEQ ID NO. 3 in each conserved position marked by an asterisk (*), as shown below in comparison to Aspergillus aculeatus Avicelase III (AviIII_Aac):

GH74_Ace	ATTQPYTW9NVAIGGGG-FVDGIVFNEGAPGILYVRTDIGGMYRWDAANGRWIPLLDWVG
AviIII_Aac	AASQAYTWKNVVTGGGGGFTPGIVFNPSAKGVAYARTDIGGAYRLNSDD-TWTPLMDNVG
	र्: म्रेनेने, वर्षः, त्रात्रेत्रः, वर्षत्रेत्रेणः । वर्षः त्राप्तक्षत्रेष्ठते केणः । । वर्षः वर्षः वर्षः
GH74_Ace	wnnwgyngvvsiaadpintnkvwaavgmytnswdpndgailrssdqgatwqitplpfklg
AviIII_Aac	NDTwhdwgidalatdpvdtdrvyvavgmytnewdpnvgsilrstdogdtwtetklpfkvg
	ा.त १६ ६१७१८८१११४८१११४८६१४४४४५ च्याप्य ११७४४४१४४५ ४४ - ४ ४४४४५४
GH74_Ace	Gnmpgrgmgerlavdpnndnilyfgapsgkglwrstdsgatws <u>o</u> mtnppdvgtylanptd
AviIII_Aac	GNMPGRGMGERLAVDPNKNSILYPGARSGHGLWKSTDYGATWSNVTSFTWTGTYPQDSSS
	ந்த்துக்குக்குக்குக்குக்குக்குக்கும். இதுக்குக்கு இதுக்குக்கு இதுக்குக்கு இதுக்குக்கு இதுக்குக்கு இதுக்குக்கு இதுக்குக்குக்குக்குக்குக்குக்குக்குக்குக்
GH74_Ace	TTGYQSDIQGVVWVAFDKSSSSLGQASKTIFVGVADPNNPVFWSRDGGATWQAVPGAP-T
AviIII_Aac	TYTSDPVGlawvtfdstsgssgsatprifvgvadagksvfksedagatwawvsgepqy
	* * ** ** **;**;**;;*,;* *;*; *******;;;;** *;*;**** *;*;*
GH74_Ace	GFIPHKGVFDPVNHVLYIATSNTGGPYDGSSGDVWKFSVTSGTWTRISPVPSTDTANDYF
AviIII_Aac	GPLPHKGVLSPBEKTLYISYANGAGPYDGTNGTVHKYNITSGVWTDISPT\$LASTYY
_	**;******; = ::, ***;

GH74_Ace	GYSGLTIDRQHPNTIMVATQISWWPDTIIFRSTDGGATWTRIWDWTSYPNRSLRYVLDIŞ
AviIII_Aac	GYGGLSVDLQVPGTLMVAALNCWWPDELIFRSTDSGATWSPIWEWNGYPSINYYYSYDIS
	********* * **************************
GH74_Ace	AEPWLTFGVQPNPPVPSPKLGWMDEAMAIDPFNSDRMLYGTGATLYATNDLTKWDSGGQ1
AviIII_Aac	NAPWIQDTTSTDQFP -VRVGMMVEALAIDPFDSNHWLYGTGLTVYGGHDLTNWDSKHNV
	लनेर १२४१ रानेनेन सम्रम्भमन्त्रेत्रः न्त्रेष्ट्रम ११० र्वेन्ट्रम्भ ११
GH74_Ace	Hiapmvkgleetavndlisppsgaplisalgdlggfthadvtavpstiptspvfttgtsv
AviIII_Aac	TVKSLAVGIREMAVLGLITPPGGPALLBAVGDDGGFYHSDLDAAPNQAYHTPTYGTTNGI
	ह । इ. तेर्त्रे तेते (सर्वेद्वेत्रे) स्वास्त्रेत्रेण प्रति त्रास्त्र कर्मा । इ. इत्यास्त्र कर्मा
GH74_Ace	DYAPLNPSIIVRAGSFDPSSQPNDRHVAFSTDGGKNWFQGSEPGGVTTGGTVAASADGSR
AviIII_Aac	DYAGNKPSNIVRSGASDDYPTLALSSNFGSTWYADYAASTSTGTGAVALSADGDT
_	*** :** ***:*: * . : :#:#:: **: * *:** ****
QUB	
GH74_Ace	fvwapgdpgqpvvyavgfgnswaasqgvpanaqirsdrvnpktfyalsngtfyrstdggv
AviIII_Aac	VLLMSSTSGALVSKSQGTLTAVS9LPSGAVIASDKSDNTVFYGGSAGAIYVSKNTAT
	ा १६०४-४९ वर्षे । इ.स. १०० वर्षे १४३वेड४९ के तेत्रेष्ट्राच्यात्रेष्ट्रा स्टब्स्स्य स्टब्स्स्य स्टब्स्स्य व्याप स्टब्स्स्य
GH74_Ace	tfqpvaaglpssgavgvmfhavpckegdlwlaassglyhstnggsswsai-tgvssavnv
AviIII_Aac	sftktvs-lgssttvnair-ahpsiagdvwastdkglwhstdygstptqigsgvtagwsf
	- 1* - 1.1 * ** 1*,11 * * **; **; * 11,.**;***; **;;; * 1**;;, *,
GH74_Ace	GFGKSAPGSSYPAVFVVGTIGGVTGAYRSDDCGTTWVLINDDQHQYGN WGQAITGDHAN
AviIII_Aac	GFGKASSTGSYVVIYGFFTIDGAAGLFKSEDAGTNWQVISDA6HGFGSGSANVVNGDLQT

GH74_Ace	LRRVYIGTNGRGIVYGDIGGAPSG
AviIII_Aac	
_	YGRVFRGHERPGHLLRQSQREPAG

- 51. (Currently amended) The composition of claim 49 50 wherein said polypeptide retains at least the same level of cellulase activity and thermal tolerability as those exhibited by the peptide of SEQ ID NO. 1.
- 52. (Currently amended) A composition comprising a genetically engineered purified polypeptide expressed in a heterologous host cell, said polypeptide having an amino acid sequence identical to SEQ ID NO. 1, said polypeptide characterized by a catalytic domain of a glycosyl hydrolase family 74 (GH74_Ace) enzyme and a carbohydrate binding domain (CBD) III.

53. (Currently amended) A composition comprising a genetically engineered purified polypeptide expressed in a heterologous host cell, said polypeptide being characterized by a catalytic domain of a glycosyl hydrolase family 74 (GH74_Ace) enzyme and a carbohydrate binding domain (CBD) III, said catalytic domain of GH74_Ace having a sequence that is at least 90% 99% identical to SEQ ID NO. 3.

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- 54. (Currently amended) The composition of claim <u>53</u> 51 wherein said catalytic domain of GH74_Ace has a sequence identical to SEQ ID NO. 3.
- 55. (Currently amended) A composition comprising a genetically engineered polypeptide expressed in a heterologous host cell, said polypeptide having at least 90% 99% identity to SEQ ID NO. 1.
- 56. (Currently amended) A composition comprising a genetically engineered polypeptide expressed in a heterologous host cell, said polypeptide comprising a sequence having at least 90% 99% identity to SEQ ID NO. 3.
- 57. (New) A composition comprising a genetically engineered polypeptide expressed in a heterologous host cell, said polypeptide having at least 90% identity to the polypeptide sequence of SEQ ID NO: 4 and having carbohydrate binding activity.
- 58. (New) A composition comprising a genetically engineered polypeptide expressed in a heterologous host cell, said polypeptide having at least 90% identity to the polypeptide sequence of SEQ ID NO: 5 and having carbohydrate binding activity.
- 59. (New) A composition comprising a genetically engineered polypeptide expressed in a heterologous host cell, said polypeptide having means for providing cellulase activity as a glycosyl hydrolase 74 (GH74) family enzyme according to SEQID NO. 1.